CARPENTRY

PURPOSE

To evaluate each contestant's preparation for employment and to recognize outstanding students for excellence and professionalism in the field of residential and commercial carpentry.

First, refer to General Regulations, Page 9.

CLOTHING REQUIREMENT

Official SkillsUSA khaki work shirt and pants, black or brown leather work shoes, and safety glasses with side shields or goggles. (Prescription glasses can be used only if they are equipped with side shields. If not, they must be covered with goggles.) To purchase official work clothes, contact Midwest Trophy Manufacturing Co. Inc. by calling 800-324-5996 or order online at www.mtmrecognition.com/skillsusaz.

Note: Contestants must wear their official contest clothing to the contest orientation meeting.

ELIGIBILITY

Open to active SkillsUSA members enrolled in programs with carpentry as the occupational objective.

SAFETY REQUIREMENT

Both the instructor and the contestant certify by agreeing to enter this contest that the contestant has received instructions and has satisfactorily passed an examination on the safe use of a portable power saw. They also certify that the contestant's saw has been thoroughly inspected and is in safe working condition. Further they agree that SkillsUSA Inc., the SkillsUSA Championships technical committee and national judges are released from all responsibility relating to personal injuries resulting from its use. Contestants will be removed from competition if proper training has not been provided and/or they are using the equipment in an unsafe manner.

EQUIPMENT AND MATERIALS

1. Supplied by the technical committee:
   a. Sufficient lumber for two 2'x4' sawhorses for each contestant
   b. All lumber and materials, as specified on the job sheet
   c. Job sheets and blueprints for each contestant and judge
   d. All necessary information and furnishings for judges and technical committee
   e. Hard hat
2. Supplied by the contestant:
   a. Four portable sawhorse brackets (steel or plastic) that accept 2"x4" lumber only
   b. One 8 pt. crosscut saw (10 pt. or 12 pt. optional)
   c. Claw hammers (one trim and one framing)
   d. One set chisels ($^1/_4$" to 1")
   e. Framing square
   f. 6' folding rule and/or 16' or longer steel tape measurer
   g. Utility knife with standard and hookbill blades
   h. Two pencils
   i. One each — 1 and 2 pt. Phillips and 4" and 8" standard screwdrivers
   j. Wrecking bar or gooseneck pinch bar
   k. Coping saw and extra blades
   l. Cat's paw (nail puller)
   m. Chalk box and line
   n. One each $^1/_{32}$", $^2/_{32}$" and $^3/_{32}$" nail sets
   o. Straight aviation snip or any metal cutting snips
   p. 24" or 30" spirit level
   q. Blockplane
   r. Combination wood rasp and file (8")
   s. Carpenter's tool and nail pouch with belt and/or suspenders
   t. Stair gauges (optional)
   u. One pair slip joint pliers
   v. Combination square and/or speed square
   w. 25' power cord (UL approved grounded)
   x. Calculator
   y. Power circular handsaw with new carbide-tipped blade
3. One-page, typewritten résumé

SCOPE OF THE CONTEST

Knowledge Performance

The contest will include a written knowledge test that assesses knowledge of carpentry including, but not limited to, building materials, foundations and forms, rough framing, roof framing, exterior finish, interior finish, stairs, lumber and tools.

Skill Performance

The contest will assess accuracy, workmanship, the ability to read and interpret blueprints, and the proper use of tools and equipment. Contestants will frame walls using wood and steel studs, cut and install common, hip and jack rafters, and install drywall, baseboard moldings and window trim.

Contest Guidelines

1. Time limit: Contestants will be stopped when time limits, as specified on the contest job sheet, are up; however, contestants may stop whenever they have completed a particular phase of the contest.
2. The dismantling of the project will be considered the final sequence or task of this contest.

Note: If desired, a contestant may choose to use a standard handsaw without penalties.

Standards and Competencies

C 1.0 — Read blueprints and specifications by interpreting dimensions and specifications, as well as door, window and finish schedules while understanding common blueprint abbreviations and symbols

- 1.1 Interpret and determine dimensions from multiple view drawings and build the project from plans, elevations, sections and details
- 1.2 Interpret specifications and drawing notes by verbally demonstrating how specifications are used
- 1.3 Identify plot plan information such as reference points and bench marks by locating the reference point; using Pythagorean theory, a level and square, the participant can layout building as drawn on the plot plan
- 1.4 Interpret oral and written changes, and incorporate modifications into existing plans
- 1.5 Understand common abbreviations and symbols and verbally describe all common blueprint abbreviations and symbols on competition blueprints
- 1.6 Interpret door, window and finish schedules by describing location, quantity, and type of materials used at 95 percent accuracy

C 2.0 — Organize building site/materials in a safe and sequential manner while using builder's level and transit properly

- 2.1 Use builder's level and transit properly for layout and elevation to properly lay out and level the site at no more than one-degree off level and out of square
- 2.2 Identify, receive and inspect materials and ensure all required materials are in place prior to start of competition by using material lists supplied
- 2.3 Store lumber and other materials properly by type and use in a safe and sequential manner

C 3.0 — Build foundations and forms including the construction and alignment of footing forms, wall and wall forms, and column and pier forms

- 3.1 Construct and align various footing forms to include keyways, bulkheads, dowels and anchorages, as per site plans and various forms within a (+/-) $\frac{1}{8}$" variable
- 3.2 Construct and align foundation wall and wall forms to include pilasters and beam pockets
- 3.3 Construct and align column and pier forms
- 3.4 Maintain form materials properly

C 4.0 — Construct rough framing by identifying and selecting framing members, and installing frame components while meeting OHSA standards

- 4.1 Identify framing members and select materials for project
- 4.2 Frame and install sill plate, girders, floor joists and bridging
- 4.3 Frame floor
- 4.4 Install sub-floor
- 4.5 Build or erect safe scaffolding to meet OHSA standards
- 4.6 Frame and brace walls to include corners, openings, trimmers, cripples, partitions, plumbing partitions, fixture backing, and sheathing
- 4.7 Frame stair stringer and other components

C 5.0 — Construct roof framing by determining rafter lengths, making calculations, laying out a plan, framing and installing roof sheathing

- 5.1 Identify types and components of roof construction and verbally describe all typical components of roof construction identified on the competition project blueprint
- 5.2 Determine rafter lengths from a rafter scale
- 5.3 Calculate and use the rise and run of a common roof
- 5.4 Lay out a common roof plan

5.5 Lay out, cut and install common rafters, ridge board, collar ties, gambrel rafters, valley rafters, valley jack rafters, tail rafters, hip rafters, hip jack rafters and cripple jack rafters
5.6 Frame roof openings, dormers and saddles
5.7 Lay out, cut and install roof trusses (purling)
5.8 Install roof sheathing

C 6.0 — Construct exterior finish by installing frames, corner boards, moldings, cornices, siding and shingles as per industry standards

6.1 Install window and doorframes as per competition project blueprint and manufacturer's standards
6.2 Measure, cut and install trim for window and door frames within $\frac{1}{8}$"
6.3 Install corner boards, moldings or metal/vinyl corners within $\frac{1}{8}$"
6.4 Install wood bevel and lap siding and aluminum or vinyl siding as per competition project blueprint and manufacturer's recommendations
6.5 Install wood shingles and miter corners as per industry standards
6.6 Install exterior finish rake, open cornice and box cornice as per competition project blueprint and within $\frac{1}{8}$"

C 7.0 — Construct interior finish while measuring and cutting materials, fitting and hanging doors and trim, constructing closets and installing crown moldings

7.1 Measure, cut and install gypsum board to meet blueprint specs and industry standards
7.2 Cut and install paneling while trimming to fit in prescribed locations within $\frac{1}{8}$" for paneling and $\frac{1}{16}$" for trim
7.3 Fit and hang doors and trim to include swinging, sliding, folding, and pocket doors to industry and manufacturers' standards
7.4 Construct closets and built-in units and install accessories as per competition blueprint specs and manufacturers' recommendations
7.5 Cut and install crown molding or other moldings within $\frac{1}{16}$"

C 8.0 — Build stairs by laying out stringer and stringer sets, calculating rise, run and tread cutting and installing stair treads and stair skirts

8.1 Lay out a straight run stringer and a two-flight stringer set with landing using a carpenter square within a $\frac{1}{8}$" variable
8.2 Calculate rise, run and tread width within $\frac{1}{16}$"
8.3 Cut and install stair treads and stair skirt within a $\frac{1}{8}$" variable

C 9.0 — Identify lumber by writing a requisition for ordering lumber

9.1 Match letters designating uses in plywood or composition board to their current application at 80 percent accuracy
9.2 Match at least two examples each of common hardwoods and softwoods to their uses
9.3 Identify types of trim and moldings, and describe use when prompted
9.4 Identify common defects in lumber
9.5 Write a requisition for ordering lumber based on a given material list
9.6 Calculate board feet using the standard formula (No. of pieces × thickness in inches × width in inches × length in feet ÷ 12 = board feet)

C 10.0 — Using and maintaining tools safely per manufacturers' recommendations

10.1 Inspect and properly use hand tools as per manufacturers' recommendations. Hand tools from the following list: sliding t-bevel, tape measure, combination square/speed square coping saw, keyhole saw, folding rule, hammer, punch, handsaw, nail set, wood chisel, carpenter's level, framing square and hand plane
10.2 Inspect and properly operate power tools as per manufacturers' recommendations. Power tools from the following list: reciprocating (jig saw), miter saw, hand drill, belt sander, circular saw, sabre saw, table saw, hand plane, finish sander, hand router, pneumatic nailers and time limit

Committee Identified Academic Skills

The technical committee has identified that the following academic skills are embedded in this contest.

Math Skills

- Use fractions to solve practical problems
- Use proportions and ratios to solve practical problems
- Measure angles
- Find surface area and perimeter of two dimensional objects
- Apply transformations (rotate or turn, reflect or flip, translate or slide, and dilate or scale) to geometric figures
- Construct three-dimensional models
- Apply Pythagorean Theorem
- Make comparisons, predictions and inferences using graphs and charts

- Find slope of a line
- Solve practical problems involving complementary, supplementary and congruent angles
- Solve problems involving symmetry and transformation

Science Skills

- Use knowledge of work, force, mechanical advantage, efficiency and power
- Use knowledge of simple machines, compound machines, powered vehicles, rockets and restraining devices

Language Arts Skills

- Provide information in conversations and in group discussions
- Provide information in oral presentations
- Demonstrate use of nonverbal communication skills, such as eye contact, posture and gestures using interviewing techniques to gain information
- Demonstrate comprehension of a variety of informational texts
- Use text structures to aid comprehension
- Identify words and phrases that signal an author's organizational pattern to aid comprehension
- Understand source, viewpoint, and purpose of texts

Connections to National Standards

State-level academic curriculum specialists identified the following connections to national academic standards.

Math Standards

- Numbers and Operations
- Geometry
- Measurement
- Data Analysis and Probability
- Problem Solving
- Communication
- Connections
- Representation

Source: NCTM Principles and Standards for School Mathematics. To view high school standards, visit: standards.nctm.org/document/chapter7/index.htm. Select "Standards" from menu.

Science Standards

- Understands the structure and function of cells and organisms
- Understands relationships among organisms and their physical environment
- Understands the sources and properties of energy
- Understands forces and motion
- Understands the nature of scientific inquiry

Source: McREL compendium of national science standards. To view and search the compendium, visit: www.mcrel.org/standards-benchmarks/.

Language Arts Standards

- Students adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes
- Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge

Source: IRA/NCTE Standards for the English Language Arts. To view the standards, visit: www.readwritethink.org/standards/index.html.

Contest Scorecard

Items Evaluated	Possible Points
Tools	50
General Safety	100
Layout of Work	150
Construction	300
Assembly	150
General Workmanship	150
Written Test	100
Sub Total	**1,000**
Résumé Penalty	_____
Clothing Penalty	_____
TOTAL	_____